

Applicant Initiated Interview Request FormApplication No.: 10/552,916
Examiner: REDDY, KARUNA P.First Named Applicant: Asim Sarkar
Art Unit: 1796 Status of Application: Pending**Tentative Participants:**(1) Mark J. Young (2) Asim Sarkar
(3) _____ (4) _____Proposed Date of Interview: October 26, 2009Proposed Time: Any (AM/PM)**Type of Interview Requested:**(1) ☒ Telephonic (2) ☐ Personal (3) ☐ Video ConferenceExhibit To Be Shown or Demonstrated: ☐ YES ☐ NO

If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) <u>103</u>	<u>All</u>	<u>Cited in Action</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) _____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Continuation Sheet Attached☒ Proposed Amendment or Arguments Attached**Brief Description of Arguments to be Presented:**

See attached proposed amendment and remarks.

An interview was conducted on the above-identified application on _____.

NOTE: This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP § 713.01).

This application will not be delayed from issue because of applicant's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible. Art

/Mark J. Young/

Applicant/Applicant's Representative Signature

Examiner/SPE Signature

Mark J. Young

Typed/Printed Name of Applicant or Representative

39,436

Registration Number, if applicable

This collection of information is required by 37 CFR 1.133. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Asim Sarkar

Serial No.: 10/552,916

Confirmation No.: 4536

Filed: 09/18/2006

Docket No.: 294-231 PCT/US

Group Art Unit: 1796

Examiner: REDDY, KARUNA P.

For: **POLYMERIZATION INITIATOR SYSTEM**

REPLY UNDER 37 C.F.R. § 1.111

In response to the non-final office action dated 07/07/2009, kindly enter the following Amendments in light of the accompanying Remarks. A new power of attorney and change of correspondence address are provided with this response. A request for an interview is also provided with this request.

CLAIMS

Kindly cancel pending claims 1 through 24 and add new claims 25-46, as presented below. The listing of claims set forth below replaces all prior listings of claims.

Claims 1-24 (Cancelled).

Claim 25. (New) A polymerization initiator package, comprising

a bag having a sealable opening, said bag being comprised of a water soluble polymeric material, and

a determined amount of a dry powder water soluble azo-initiator contained inside the bag, and

a sealing member comprised of the same water soluble polymeric material as the polymeric bag, said sealing member adapted to close the opening of the bag containing the dry powder water soluble azo-initiator, and said sealing member not causing physico-chemical changes to the water soluble polymeric material comprising the bag.

Claim 26. (New) A polymerization initiator package according to claim 25, said sealing member comprising a tie-wrap.

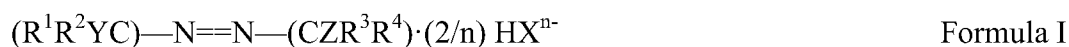
Claim 27. (New) A polymerization initiator package according to claim 25, said sealing member comprising a tape.

Claim 28. (New) A polymerization initiator package according to claim 25, wherein the water-soluble polymeric material is a water-soluble cellulosic polymer.

Claim 29. (New) A polymerization initiator package according to claim 25, wherein the water-soluble polymeric material is a water-soluble polymeric cellulose derivative.

Claim 30. (New) A polymerization initiator package according to claim 25, wherein the water-soluble polymeric material is a water-soluble polyvinylalcohol.

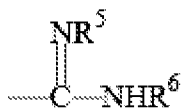
Claim 31. (New) A polymerization initiator package according to claim 25, wherein the dry powder water soluble azo-initiator is selected from the group consisting of compounds represented by the formula



wherein

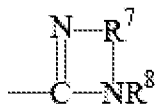
R^1 , R^2 , R^3 and R^4 each represent a hydrocarbon compound from the group consisting of an alkyl group or cycloalkyl group,

Y represents a compound from the group consisting of



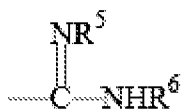
and

Formula II



Formula III

Z represents a compound from the group consisting of



and

Formula II



Formula III

R⁵ is a constituent from the group consisting of a hydrogen atom, an alkyl, an allyl and a phenyl,

R⁶ is a constituent from the group consisting of a hydrogen atom, an alkyl or a phenyl,

R⁷ is an optionally substituted alkylene group,

R⁸ is a constituent from the group consisting of a hydrogen atom and a hydroxyalkyl group,

X is an anion from the group consisting of a monovalent chloride, bromide and acetate, wherein n represents its valence.

Claim 32. (New) A polymerization initiator package according to claim 31, wherein the dry powder water soluble azo-initiator is 2,2'-Azobis(2-amidinopropane), 2,2'-azobis[2-(2-imidazolin-2-yl)propane].

Claim 33. (New) A polymerization initiator package according to claim 31, wherein the dry powder water soluble azo-initiator is a salt of 2,2'-Azobis(2-amidinopropane), 2,2'-azobis[2-(2-imidazolin-2-yl)propane].

Claim 34. (New) A polymerization initiator package according to claim 26, wherein the determined amount of dry powder water soluble azo-initiator is 1 g to 25 kg.

Claim 35. (New) A polymerization initiator package according to claim 26, wherein the determined amount of dry powder water soluble azo-initiator is 100 g to 10 kg.

Claim 36. (New) A polymerization initiator package according to claim 26, wherein the determined amount of dry powder water soluble azo-initiator is 500 g to 5 kg.

Claim 37. (New) A polymerization initiator package according to claim 26, wherein the determined amount of dry powder is an amount effective to initiate polymerization of a determined monomer in an aqueous medium.

Claim 38. (New) A polymerization initiator package according to claim 26, further comprising a water soluble anti-foaming agent contained inside the bag.

Claim 39. (New) A polymerization initiator package according to claim 26, further comprising a water soluble diluent contained inside the bag.

Claim 40. (New) A polymerization initiator package according to claim 26, further comprising a water soluble anti-foaming agent and a water soluble diluent contained inside the bag.

Claim 41. (New) A polymerization initiator package according to claim 26, further comprising an outer container and a label applied to the outer container, said label specifying the determined amount of dry powder.

Claim 42. (New) A polymerization initiator package according to claim 26, further comprising an outer container and a label applied to the outer container, said label specifying the determined amount of dry powder and providing a certificate of analysis.

Claim 43. (New) A polymerization initiator package according to claim 26, wherein the dry powder constitutes about at least 75 wt. % of the polymerization initiator package.

Claim 44. (New) A polymerization initiator package according to claim 26, wherein the dry powder constitutes about 90 to 99.9 wt. % of the polymerization initiator package.

Claim 45. (New) A polymerization initiator package according to claim 26, wherein the dry powder constitutes about 95 to 99 wt. % of the polymerization initiator package.

REMARKS

I. NEW CLAIMS 25-45 ARE PRESENTED TO ACCURATELY AND PARTICULARLY POINT OUT AND DISTINCTLY CLAIM THE SUBJECT MATTER WHICH THE APPLICANT REGARDS AS HIS INVENTION

The original claims filed with this application accurately recited embodiments of the invention. However, during prosecution, counsel for Applicant proposed amendments to the claims which recite embodiments that are inconsistent with the specification. By way of example, the claims addressed in the non-final office action dated 07/07/2009 erroneously recite a container consisting of an azo-initiator. Specifically, independent Claim 1 addressed in the non-final office action dated 07/07/2009 erroneously recites: "Polymerization initiator system, comprising a watersoluble container consisting of a water-soluble azo-initiator or a water-soluble azo-initiator and at least one component selected from the group consisting of water-soluble anti-foaming agents and water-soluble diluent materials." This is a mistake which clearly contradicts the specification.

Rather than correct the pending amended claims, Applicant hereby cancels all pending claims and replaces them with new Claims 25-45 that accurately and particularly point out and distinctly claim the subject matter which the Applicant regards as his invention, consistent with the specification. The new claims include one independent claim, i.e., Claim 25, and nineteen claims, i.e., Claim 26-45, that depend from Claim 25.

As supported by the specification, new independent Claim 25 recites a polymerization initiator package comprising a bag having a sealable opening. [US 2007/0060662, p. 2, ¶ 0022]. The bag is comprised of a water soluble polymeric material. [p. 2, ¶ 0023]. A determined amount of a dry powder water soluble azo-initiator is contained inside the bag. [p. 2, ¶ 0021; p. 3, ¶ 0051]. A sealing member is comprised of the same water soluble polymeric material as the polymeric bag. [p. 3, ¶ 0054]. The sealing member closes the opening of the bag containing the dry powder water soluble azo-initiator, and said sealing member not causing physico-chemical changes to the water soluble polymeric material comprising the bag. [p. 3, ¶ 0054].

As recited in Claims 26 and 27, the sealing member may be a tie or wrap. [p. 3, ¶ 0054]. The water soluble polymer comprising the bag may be a water-soluble cellulosic polymer as recited in Claim 28, a water-soluble polymeric cellulose derivative as recited in Claim 29 or a water-soluble polyvinylalcohol as recited in Claim 30. [p. 2, ¶ 0024]. The dry powder azo-initiator may be any of the compounds recited in Claims 31, 32 or 33. [p. 2, ¶¶ 0031-42; p.3, ¶¶ 0043-0048]. As recited in Claims 34 through 37, the bag may contain various masses (weights) of azo-initiator. [p. 3, ¶ 0057]. Diluents and/or anti-foaming agents may be contained with the azo-initiator in the bag, as recited in Claims 38 through 40. [p. 3, ¶¶ 0059-0061]. A label may be provided on an outer container in which the water-soluble bag is contained, as recited in Claims 41 and 42. [p. 3, ¶ 0056]. The vast majority of the claimed package is the contained contents, as recited in Claims 43 through 45. [p. 3, ¶ 0058].

Applicant's invention recited in Claim 25 includes several advantageous features that are not disclosed, taught or suggested in any prior art. First, as recited in Claim 25, the bag contains a dry powder azo-initiator that is toxic and an irritant to skin, eyes and lungs. Prior to

Applicant's invention, the prevailing industry practice was to process the raw azo-initiator powder into granules using costly granulation equipment. However, even after such processing, the granules produce deleterious dust, especially as the integrity of the granules degrades with handling and over time. Furthermore, granulation may compromise the quality of the initiator. Applicant avoids costly granulation as well as the inevitable deleterious dust and compromised initiator quality associated with granules. Applicant's bag prevents any human contact and risk of the contained powder particles becoming airborne. The bag also prevents loss of the contained expensive powder and facilitates introduction of the determined amount of powder into a polymer composition. Moreover, the bag allows use of the unadulterated raw powder in its purest form.

Another advantageous feature that is not disclosed, taught or suggested in any prior art is the closure of Applicant's invention recited in Claim 25. Applicant's bag is cinched and sealed using a sealing member (e.g., a tie or wrap) made of the same material as the bag. Thus, Applicant's claimed invention avoids sealing processes and substances that may cause undesirable physico-chemical changes or formation of insoluble particles in the container material. Applicant's invention avoids heat sealing, adhesives and bonding agents, any of which may cause physico-chemical changes in the package which could have unintended consequences on the polymerization process.

In sum, none of the cited references discloses a water soluble bag containing an azo-initiator, much less a dry powder azo-initiator as recited in new Claim 25. Additionally, none of the cited references disclose closing a flexible bag using a tie or wrap made of the same material as the bag to avoid physico-chemical changes that may adversely impact polymerization.

Furthermore, none of the cited references provide any motivation or suggestion to make the combination recited in new Claim 25.

II. MCVAY (US 3, 784, 005) IN VIEW OF AMO ET AL (EP0668098 A1), DUFFIELD ET AL (US 2003/0108705 A 1) AND YUKI [UCHIYAMA] ET AL (JP 56048210 A) DO NOT RENDER OBVIOUS UNDER 35 U.S.C. 103(a) CLAIM 25 OR CLAIMS 26-45, EACH OF WHICH DEPENDS FROM CLAIM 25.

In the non-final office action, the examiner rejected Claims 19 and 21 under 35 U.S.C. 103(a) as being unpatentable over McVay (US 3,784, 005) in view of Amo et als (EP 0 668 098 A1) and Duffield et al (US2003/0108705 A 1). Applicant's new claims presented above traverse this rejection.

The non-final office action dated 07/07/2009 cites McVay US-3,784,005, Amo EP-0668098 and Duffield US-2003/108705 which disclose a water-insoluble extremely thin plastic container, a method for producing spherical granules of a water-soluble azo compound, and a rigid, water-soluble container made of an injection molded PVA and/or a cellulose ether with a separate film bonded to the top. While water soluble containers and azo compounds may be known in the art, the combination of elements recited in new Claim 25 is new and nonobvious and Claim 25 recites elements not disclosed, taught or suggested anywhere in the prior art.

McVay US-3,784,005 teaches an envelope formed of a thin (i.e., not more than 2 mils thick) polystyrene film that must be contained within a rigid supporting container to survive in storage and handling. [Col. 5, lines 13-18]. Polystyrene is not soluble in water. As other materials for the container, McVay mentions vinyl toluene, methyl methacrylate, alpha-methyl

styrene, diallyl phthalate, triallyl cyanurate, and methyl acrylate. [Col. 4, lines 33-39]. These compounds exhibit such poor or no solubility in water that they could not credibly be considered to be water soluble. Additionally, McVay discloses a heat seal which results in physic-chemical changes. [Col. 6, line 18]. In contrast, Applicant's Claim 25 recites a water soluble bag that is tied close using a tie or wrap made of the same material as the bag. In sum McVay discloses a very different type of water-insoluble container, that is intended for a very different type of reaction system, and that makes no mention of dry powder azo-initiator or sealing using a sealing member composed of the same material as the container.

Amo EP-0668098 teaches away from Applicant's claimed polymerization initiator package by providing a process for producing spherical granules of a water-soluble azo compound. A purpose of providing azo-initiator in granular form is to facilitate handling while reducing airborne dust. Amo's asserted improvement over prior art granulation methods is dropwise addition of water or a hydrophilic solvent to a suspension of a water-soluble azo compound in a water-insoluble solvent while stirring. [p. 3, lines 38-58]. Amo asserts that the granular product is spherical. Thus, Amo teaches a method for producing spherical granular azo compounds. Amo does not disclose, teach or suggest enclosing dry powder azo-initiator in a water soluble container. In sharp contrast, as discussed above, Applicant's invention recited in new Claim 25 and supported by the specification uses a pure raw dry powder azo-initiator. Applicant's invention obviates expensive granulation of azo-initiator while avoiding the serious problems associated with granule deterioration and choking.

Duffield et al. US-2003/108705 is not concerned at all with extremely sensitive polymerization processes or the possibility of adulteration. Rather Duffield discloses a rigid

package for delivering detergents and similar compounds into an aqueous environment. Specifically, Duffield discloses a rigid, water-soluble container made of an injection molded PVA and/or a cellulose ether for the delivery into an aqueous environment of substances such as detergents, pesticides, biocides, deodorants, dyes and pigments, and water-treatment chemicals. In a particular embodiment, Duffield teaches encasing a detergent in the rigid container. The container includes a receptacle with side walls that terminate at their upper end in an outward flange. A separate plastic film is attached over the flanged ends with adhesive or by heat, infrared, radio frequency, ultrasonic, laser, solvent, vibration or spin welding, each of which causes physico-chemical changes. In sharp contrast, Applicant's container as recited in new Claim 25 is a flexible bag, which is wrapped and tied close using a tie made of the same material as the bag to avoid adulterating the polymers.

Although the Supreme Court in KSR Int'l Ca. v. Teleflex Inc., 127 S. Ct. 1727, 1739, 167 L. Ed. 2d 705 (2007), rejected a strict application of the "teaching, motivation, suggestion" test, the Court nevertheless did not overrule the all elements rule, which requires that each claim feature be present in the prior art to support an obviousness rejection. See CFMT, Inc. v. YieldUp Int'l Corp., 349 F.3d 1333, 1342, 68 USPQ2d 1940 (Fed. Cir. 2003); In re Gulack, 703 F.2d 1381, 1385 n.8, 217 USPQ 401 (Fed. Cir. 1983); In re Royka, 490 F.2d 981, 985, 180 USPQ 580 (CCPA 1974) (obviousness requires a suggestion of all limitations in a claim). The KSR decision did not address the issue of the all elements test because all of the elements in the device at issue were present in the asserted combination. Instead, it was the propriety of the asserted combination that was at issue in KSR. In sum, it remains well-settled law that a finding of obviousness requires at least a suggestion of all of the features in a claim.

The Court in *KSR* further explained that “a patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art.” *KSR Int’l Ca. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739, 167 L. Ed. 2d 705 (2007). Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *Id.*, citing *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006). Thus, obviousness requires the prior art to disclose all the elements in a claim and “a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR*, 127 S. Ct. 1727, 1741.

Evidence rebutting a prima facie case of obviousness may include a teaching away by the prior art. A reference “may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130 (Fed. Cir. 1994); see *KSR*, 127 S. Ct. at 1739-40 (explaining that when the prior art teaches away from a combination, that combination is more likely to be nonobvious). Additionally, when a proposed combination of a prior art reference with another reference would diminish the ability of the main reference to operate for its intended purpose, the combination teaches away, and fails to establish a prima facie case of obviousness, as a matter of law. *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 60 USPQ2d 1001 (Fed. Cir. 2001); See also, *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984) (inoperable modification teaches away); and *In re Sponnoble*, 405 F.2d 578, 587, 160 USPQ 237, 244 (CCPA 1969) (references teach away from combination if combination produces seemingly an inoperative device).

Here, it would not have been obvious at the time of Applicant's invention to combine the teachings of McVay with those of Amo and Duffield. McVay teaches a thin water insoluble container that must be kept in a separate durable container to preserve its integrity during storage and handling, while Duffield teaches a rigid water-soluble container that must be sealed by attaching a separate film to the top flanged edges of the container using techniques that cause physic-chemical changes. The teachings of McVay and Duffield are irreconcilable.

Amo teaches away from Applicant's claimed containment bag by disclosing an elaborate method of granulation, which is a costly alternative to Applicant's soluble bag containing azo-initiator in its purest raw powder form. Applicant's invention avoids the need to form granules. It would be pointless and unnecessarily costly to convert raw dry powder azo initiator to granule form, only then to contain it within the water soluble bag of Applicant's invention.

Even if the teachings of McVay, Amo and Duffield are combined, they still do not disclose or suggest several elements recited in new independent Claim 25. Specifically, they do not disclose or suggest a package containing a dry powder azo-initiator in a water soluble bag. Additionally, none of the cited references disclose closing a flexible bag using a tie or wrap made of the same material as the bag to avoid physic-chemical changes that may adversely impact polymerization.

In sum, the obviousness rejections are traversed because the cited prior art does not disclose all the elements or the combination of elements in new independent Claim 25, from which Claims 26-45 depend. Additionally, no sound reasoning supports a modification and combination of the prior art components in a manner that produces the claimed invention.

Furthermore, the prior art actually teaches away from Applicant's claimed invention by disclosing incompatible devices that would result in an unworkable product.

III. MCVAY (US 3, 784, 005) IN VIEW OF AMO ET AL (EP 0 668 098 A1), DUFFIELD ET AL (US 2003/0108705 A 1) AND YUKI [UCHIYAMA] ET AL (JP 56048210 A) DO NOT RENDER CLAIMS 38 AND 40 OBVIOUS UNDER 35 U.S.C. 103(a).

The office action additionally cites Yuki, et al. (UCHIYAMA) JP-56048210 for the conjecture that because water-soluble anti-foaming agents exist, it would have been obvious to include such agents in Applicant's claimed package. Applicant disagrees. According to a machine translation of the abstract of Yuki et al., a water-soluble anti-foaming agent is obtained by adding and reacting ethylene oxide and propylene oxide to and with a specific higher alcohol and esterifying these with the specific carboxylic acid. The office action provides no translation of the specification of Yuki et al. The translated abstract provides no suggestion or motivation to incorporate such an antifoaming agent with an azo-initiator contained in a water soluble bag. To be clear, Applicant does not dispute that compatible antifoaming exist. Rather, Applicant maintains that no prior art teaches or suggests combining an antifoaming agent into the package recited in new independent claim 25. Nothing in the abstract of Tuki et al., or any prior art, discloses or suggests an anti-foaming agent for use storage with an azo-intitator in a water-soluble bag for a polymerization process. Thus, Claims 38 and 40, which depend from Claim 26, which depends from Claim 25, are not obvious in view of the cited art.

IV. MCVAY (US 3, 784, 005) IN VIEW OF AMO ET AL (EP 0 668 098 A1), DUFFIELD ET AL (US 2003/0108705 A 1) AND DUDZIK (US 4444839) DO NOT RENDER CLAIMS 41 AND 42 OBVIOUS UNDER 35 U.S.C. 103(a).

The office action additionally cites Dudzik US 4444839 which teaches a label comprised of a printed water-soluble PVA top layer and a water-soluble adhesive layer. Dudzik describes attaching the label to water insoluble containers. [col. 2, lines 65-68; col. 3, lines 1-12]. Thus, the label can easily be removed from the container by exposing the label to water.

Applicant does not dispute that water soluble labels exist. Rather, Applicant maintains that no prior art teaches or suggests labeling the package recited in new independent claim 25. Nothing in the abstract of Dudzik, or any prior art, discloses or suggests a label applied to an outer container in which the package comprising a dry powder azo-initiator in a water-soluble bag is contained. Thus, Claims 41 and 42, which depend from Claim 26, which depends from Claim 25, are not obvious in view of the cited art.

V. THE OFFICE ACTION CITES WATER-SOLUBLE AZO INITIATOR, WAKO SPECIALTY CHEMICALS, 1997, WHICH IS NOT VALID CITABLE PRIOR ART AND, REGARDLESS, DOES NOT JUSTIFY A REJECTION OF ANY PENDING CLAIMS ON ANY GROUNDS

The Office Action rejected Claims 22-23 under 35 U.S.C. 103(a) as being unpatentable over McVay (US 3, 784, 005) in view of data for water-soluble azo-initiators (Wako Specialty Chemicals) and Duffield et al (US 2003/0108705 A 1). Claim 22, which recited a crystalline

form of the initiator has been canceled. Claim 23, which recited a powder form of the initiator has also been canceled. Pending independent Claim 25 recites a powder form of azo-initiator.

The Office Action assumes that the data for water-soluble azo-initiators (Wako Specialty Chemicals) is prior art. However, a copy of the data is not provided with the office action. Additionally, the Examiner has failed to prove that, before Applicant's date of invention or more than one year before Applicant's filing date, the Wako reference had been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it, or that the Wako product was on sale or in public use. Such proof is necessary for the cited Wako data to qualify as a citable prior art.

Regardless, citation of the Wako data is misplaced. Applicant does not deny the existence of azo-initiators in the prior art. Applicant also does not deny the prior existence of azo-initiator in powder form. Indeed, the background of the subject application acknowledges the existence of azo-initiators in various forms. The background explains that dry powders are toxic and irritant to the skin, eyes and/or the lungs. The background also explains that use of dry powders is disfavored because of the inevitable cumulative loss of the expensive initiator material in handling the powder at different stages of transfer of the initiator. In sum, Applicant does not deny that azo-initiators in powder form exist in the prior art.

Applicant claims are not directed to a mere azo-initiator. Rather, it is a package comprising a water soluble bag and containing an azo-initiator, as recited in Claim 25 and dependent Claims 26-45, that Applicant seeks to patent. More specifically, Applicant provides a means for delivery into a medium of aqueous polymerization to produce a water soluble or emulsifiable polymer.

McVay US-3,784,005 teaches an envelope formed of a thin (i.e., not more than 2 mils thick) polystyrene film that must be contained within a rigid supporting container to survive in storage and handling. [Col. 5, lines 13-18]. Polystyrene is not soluble in water. As other materials for the container, McVay mentions vinyl toluene, methyl methacrylate, alpha-methyl styrene, diallyl phthalate, triallyl cyanurate, and methyl acrylate. [Col. 4, lines 33-39]. These compounds exhibit such poor or no solubility in water that they could not credibly be considered to be water soluble. Additionally, McVay discloses a heat seal which results in physic-chemical changes. [Col. 6, line 18]. In contrast, Applicant's Claim 25 recites a water soluble bag that is tied close using a tie or wrap made of the same material as the bag. In sum McVay discloses a very different type of water-insoluble container, that is intended for a very different type of reaction system, and that makes no mention of dry powder azo-initiator or sealing using a sealing member composed of the same material as the container.

Duffield et al. US-2003/108705 is not concerned at all with extremely sensitive polymerization processes or the possibility of adulteration. Rather Duffield discloses a rigid package for delivering detergents and similar compounds into an aqueous environment. Specifically, Duffield discloses a rigid, water-soluble container made of an injection molded PVA and/or a cellulose ether for the delivery into an aqueous environment of substances such as detergents, pesticides, biocides, deodorants, dyes and pigments, and water-treatment chemicals. In a particular embodiment, Duffield teaches encasing a detergent in the rigid container. The container includes a receptacle with side walls that terminate at their upper end in an outward flange. A separate plastic film is attached over the flanged ends with adhesive or by heat, infrared, radio frequency, ultrasonic, laser, solvent, vibration or spin welding, each of which causes

physico-chemical changes. In sharp contrast, Applicant's container as recited in new Claim 25 is a flexible bag, which is wrapped and tied close using a tie made of the same material as the bag to avoid adulterating the polymers.

Here, it would not have been obvious at the time of Applicant's invention to combine the teachings of McVay with those of Duffield and Wako. McVay teaches a thin water insoluble container that must be kept in a separate durable container to preserve its integrity during storage and handling, while Duffield teaches a rigid water-soluble container that must be sealed by attaching a separate film to the top flanged edges of the container using techniques that cause physic-chemical changes. The teachings of McVay and Duffield are irreconcilable and neither reference discusses or even alludes to containing a dry powder azo-initiator.

Even if the teachings of McVay, Duffield and Wako are combined, they still do not disclose or suggest several elements recited in new independent Claim 25. Specifically, they do not disclose or suggest a package comprising a dry powder azo-initiator contained in a water soluble bag. Additionally, none of the cited references disclose closing a flexible bag using a tie or wrap made of the same material as the bag to avoid physic-chemical changes that may adversely impact polymerization.

In sum, the obviousness rejection is traversed because the cited prior art does not disclose all the elements or the combination of elements in new independent Claim 25, from which Claims 26-45 depend. Additionally, no sound reasoning supports a modification and combination of the prior art components in a manner that produces the claimed invention. Furthermore, the prior art actually teaches away from Applicant's claimed invention by disclosing incompatible devices that would result in an unworkable product. Moreover, the

Examiner has failed to prove that the cited Wako data is valid prior art. Even if the Wako data is prior art, it has not been shown to disclose, teach or in any way suggest containing a dry raw powder form of azo-initiator in a water soluble bag as recited in Claim 25, from which Claims 26-46 depend.

VI. SECONDARY INDICIA OF NONOBVIOUSNESS COMPEL A FINDING OF PATENTABILITY OF APPLICANT'S INVENTION

A declaration under 37 CFR 1.132 of Asim K. Sarkar, Ph.D., the named inventor and a highly qualified expert in the field of polymerization systems, is attached to support secondary considerations. Among the secondary considerations that compel a finding of nonobviousness are previous failure of others, solution of long-felt need, departing from the prior art's teachings, commercial success and a synergistic combination.

As set forth in the attached declaration, Dr. Sarkar is a named inventor on over two dozen chemical patents, some of which are licensed to German and Japanese chemical companies. He has published several scientific communications and reference monographs. He has over fifty (50) years of professional experience in the chemical field, including: nearly two decades of employment with Hickson & Welch Ltd. from 1951-1970, where he managed R&D for optical brightening agents; eight (8) years of employment with Cyanamid--Europe from 1970-1978, where he managed various chemicals and then directed new product development for the European, Middle East and African markets; over a decade of employment with American Cyanamid Co. from 1979-1991 where he managed commercial and business development for various products, including polymer additives, coatings and resins. In 1991 Dr. Sarkar formed Temsa International, Inc. ("Temsa"), a manufacturer and distributor of organic industrial chemicals, which he has since owned and operated.

Dr. Sarkar received and reviewed: (1) the Office Action and all of the cited prior art; (2) a complete copy of the application, including the pending claims; and (3) a complete copy of this response. Dr. Sarkar is thoroughly familiar with the claimed invention and the field of polymerization.

The cited prior art does not disclose, teach or suggest claimed elements of Applicant's invention or supply any motivation or rationale to provide a polymerization initiator package as recited in new independent Claim 25. In Dr. Sarkar's well informed opinion, no prior art teaches or enables a polymerization initiator package as recited in new independent Claim 25. From the cited references, no person of ordinary skill in the art would have any reason to provide a polymerization initiator package wherein dry powder azo-initiator is present inside a water soluble bag sealed with a material from which the bag is made; nor would a person of ordinary skill have any reasonable expectation of success that such a system would be suitable for use in aqueous polymerization systems. A person of ordinary skill would have no reason to expect that container and initiator would dissolve quickly enough for a fast initiation of a polymerization reaction, nor that the package according to the invention would be suitable to be used in the preparation of a polymer without substantially contaminating the polymer with the material of which the container is made.

Additionally, Dr. Sarkar explains that water soluble PVA containers have been known for many decades, as evidenced by Phillips et al. GB-922317A (copy attached to Dr. Sarkar's 132 declaration). Likewise, Dr. Sarkar explains that azo initiators for polymerization have been used for many decades, as evidenced by Robertson, U.S. Patent No. 2520338 (copy attached to Dr. Sarkar's 132 declaration), having a filing date of June 27, 1947, which discloses carboxyl-

containing azonitriles and their salts as initiators. Still no one has arrived at Applicant's invention recited in Claim 25. Over five decades after Phillips et al. and Robertson, leading to Applicant's claimed invention, no one has ever adapted a PVA water-soluble container to safely and efficiently deliver a determined amount of a powder azo-initiator into a medium of aqueous polymerization to produce a water soluble or emulsifiable polymer. As noted by Dr. Sarkar, such a long period in a field that is as economically significant and frequently studied as the field of technology to which his claimed invention relates clearly supports a finding of nonobviousness.

Dr. Sarkar observes that the claimed invention is contrary to the prior art's teaching. In an effort to address problems associated with toxicity and loss of expensive material, over the decades preceding Applicant's invention, chemists utilized costly granulation equipment and cumbersome processes to form azo-initiator granules. Unfortunately, however, the granules still produce deleterious dust, especially as the integrity of the granules degrades with handling and over time. Furthermore, granulation may compromise the quality of the initiator. Thus, the prior art taught granule formation in an effort to overcome the problems attributed to raw azo-initiator powder.

Rather than attempt to improve upon the process of forming granules, Dr. Sarkar opted for an entirely different approach. Dr. Sarkar's approach involved introducing a new material to an aqueous polymerization batch, namely, the material comprising the water soluble bag. Developing such an approach required considerable analysis and testing to ensure that the water soluble bag would not adversely impact the contained azo-initiator powder or the polymerization process.

As another indication of nonobviousness, the results achieved by the claimed combination are greater than the sum of the separate results of its parts. The combination is synergistic. The result, namely, safe and efficient delivery of a toxic and expensive azo-initiator in its purest form, greatly exceeds what a water soluble polymer and a dry powder azo-initiator could provide separately.

As Dr. Sarkar declares, Temsa has achieved considerable commercial success with the invention. Temsa produces and sells under the trade name AZCAT a polymerization initiator package composed of a water soluble polymeric bag with a sealable opening, a measured amount of a dry powder water soluble azo-initiator contained inside the bag, and a sealing tie comprised of the same water soluble polymeric material as the polymeric bag. The commercially successful product is the claimed invention. Since 2005, Temsa has sold 50 to 100 tons of the claimed initiator package annually. Annual sales revenue greatly exceeds \$1 million. Millions of pounds of polymers have been processed using Temsa's AZCAT initiator package.

The commercial success is due to the unique functionality and characteristics of the initiator package itself, rather than to other factors such as marketing. Where, as here, the commercially successful device is the claimed invention itself, there is a presumption of nexus between the sales and the claimed invention. See *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988). Strengthening and solidifying this nexus are the circumstances under which the purchases are made. Dr. Sarkar attests to the level of sophistication of Temsa's customers and the care with which purchases are made. The purchasing conditions are driven primarily by functionality of the claimed initiator package, rather than marketing or other factors. The decision to purchase Temsa's initiator package

requires careful consideration by knowledgeable, highly trained and extraordinarily careful industrial chemists. It takes, at the very least, several weeks for a customer to receive samples of the initiator package, test the initiator package in polymerization batches, evaluate the processing and test the resulting product. Customers have favorably expressed to Dr. Sarkar a strong preference for the dry powder water soluble azo-initiator contained in the safe-to-handle water soluble bag. Customers have also expressed to Dr. Sarkar a strong preference for the determined amount of azo-initiator. Additionally, Customers have explained that commercially available azo-initiator granules are disfavored due to their cost, tendency to produce deleterious dust, especially as granule integrity degrades with handling and the passage of time, and difficulty to properly meter the correct amount of granules into a polymerization batch.

Furthermore, other patent offices have found the claimed invention to be patentable. Specifically, the invention has already been patented in India and China. The examiner assigned to a pending European application for the invention has recently indicated that the invention recited in the pending claims is novel and inventive. While final approval has not yet been received for the European application, neither the Applicant nor the Applicant's European patent agent expects any problems. The broadest claim allowed in each country recites: "A polymerization initiator system, comprising a water-soluble container and a water-soluble azo-initiator inside the container," which is actually broader than new Claim 25. No foreign patent office has issued a final rejection of the claims. Allowance in Europe means that the European Patent Office has determined that the claimed invention involves an inventive step, which is analogous to a finding of nonobviousness. A finding that the claimed invention involves an inventive step, means that a skilled person would not have been prompted to modify the closest


prior art in such a way as to arrive at something falling within the terms of the claims. While not controlling, the favorable decisions of three other reputable patent offices weigh heavily in favor of a finding of nonobviousness of new Claim 25.

In sum, Dr. Sarkar's invention solves a long-felt and previously insoluble problem. Those skilled in the art had tried and failed to solve the problem and the art and literature are full of unsuccessful "solutions." Additionally, Dr. Sarkar's invention has achieved commercial success. Accordingly, in view of these secondary considerations, in Dr. Sarkar's expert opinion, at the time of the invention and effective filing date of the Application, it would not have been obvious to provide the polymerization initiator package as recited in new independent Claim 25.

CONCLUSION

Applicant believes that a full and complete response has been made to the restriction requirement. Applicant further believes that the elected claims are now in condition for examination and allowance. Should the Examiner believe, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided. Prompt and favorable consideration of this response is respectfully requested.

Respectfully submitted,



Mark J. Young
Reg. No. 39,436

Mark Young P.A.
12086 Fort Caroline Rd., Unit 202
Jacksonville, Florida 32225
Tel. 904-996-8099
Fax. 904-996-8234

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Docket No.: 294-231 PCT/US

Asim Sarkar

Serial No.: 10/552,916

Group Art Unit: 1796

Confirmation No.: 4536

Filed: 09/18/2006

Examiner: REDDY, KARUNA P.

For: **POLYMERISATION INITIATOR SYSTEM**

DECLARATION OF ASIM K. SARKAR, Ph.D. UNDER 37 C.F.R. § 1.132

Relative to the above-identified patent application, I, Asim K. Sarkar, do hereby declare as follows:

1. I am a competent adult.
2. I have personal knowledge of the matters contained herein, and if called as a witness I could and would testify thereto under oath.
3. I have a Ph.D. in Chemistry.
4. I am a named inventor on over two dozen chemical patents, some of which are licensed to German and Japanese chemical companies.
5. I have published several scientific communications and reference monographs.

6. I have over fifty (50) years of professional experience in the chemical field, including: nearly two decades of employment with Hickson & Welch Ltd. from 1951-1970, where I managed R&D for optical brightening agents; eight (8) years of employment with Cyanamid-Europe from 1970-1978, where I managed various chemicals and then directed new product development for the European, Middle East and African markets; over a decade of employment with American Cyanamid Co. from 1979-1991 where I managed commercial and business development for various products, including polymer additives, coatings and resins.
7. I am the founder and President of Temsa International, Inc. ("Temsa"), a Connecticut corporation with a principal address at 5 Franklin Ct, Newtown, CT 064701-468, United States.
8. Temsa manufactures and sells organic industrial chemicals.
9. I am the inventor of the subject matter described and claimed in pending U.S. Patent Application No. 10/552,916.
10. I am intimately familiar with azo initiators, including the production, handling and uses of azo initiators.
11. I consider myself to be an expert in the field of organic industrial chemicals.
12. I have reviewed the U.S. patent application referenced above ("Patent Application") and the response to the non-final office action to which this declaration is being attached.
13. I have reviewed the office action for the Patent Application.

14. The Patent Application describes and claims a polymerisation initiator package comprising a bag having a sealable opening. The bag is comprised of a water soluble polymeric material. A determined amount of a dry powder water soluble azo-initiator is contained inside the bag. A sealing member is comprised of the same water soluble polymeric material as the polymeric bag. The sealing member closes the opening of the bag containing the dry powder water soluble azo-initiator, and said sealing member not causing physico-chemical changes to the water soluble polymeric material comprising the bag.

15. I have been awarded patents in China (No. 100471880) and India (No. 229306) for a polymerization initiator system comprising a water-soluble container and a water-soluble azo-initiator inside the container. The Chinese and Indian patents were based upon the same PCT International Application as the U.S. Patent Application referenced above.

16. The broadest allowed claim of Chinese Patent No. 100471880 recites:

“1. 一种聚合引发剂系统，其包含水溶性容器和所述容器内的水溶性偶氮引发剂，其中所述容器由水溶性聚合物制成。”

which translates to: “A polymerization initiator system, comprising a water-soluble container and a water-soluble azo-initiator inside the container.”

17. The broadest claim of Indian Patent No. 229306 recites: “Polymerisation initiator system, comprising a water-soluble container and a water-soluble azo-initiator inside the container.”

18. I have a pending European patent application, EP20040739087 for the invention. The examiner assigned to my pending European application has recently indicated that the pending claims are novel and inventive. While I still await final approval, neither I nor my European patent agent expect any problems. The broadest claim of my pending European patent

application recites: “Polymerisation initiator system, comprising a water-soluble container and a water-soluble azo-initiator inside the container.”

19. I have reviewed all references cited by the examiner and applicant in connection with the Patent Application.

20. The cited references do not disclose, teach or suggest claimed elements of my invention or supply any motivation or rationale to provide a polymerization initiator package as recited in new independent Claim 25.

21. In my opinion, no prior art teaches or enables a polymerization initiator package as recited in new independent Claim 25.

22. From the cited references, no person of ordinary skill in the art would have any reason to provide a polymerization initiator package wherein dry powder azo-initiator is present inside a water soluble bag sealed with a material from which the bag is made; nor would a person of ordinary skill have any reasonable expectation of success that such a system would be suitable for use in aqueous polymerization systems.

23. A person of ordinary skill would have no reason to expect that container and initiator would dissolve quickly enough for a fast initiation of a polymerization reaction, nor that the package according to the invention would be suitable to be used in the preparation of a polymer without substantially contaminating the polymer with the material of which the container is made.

24. Water soluble PVA containers have been known for many decades, as evidenced by Phillips et al. GB-922317A (copy attached).

25. Azo initiators for polymerization have been used for many decades, as evidenced by Robertson, U.S. Patent No. 2520338 (copy attached), having a filing date of June 27, 1947, which discloses carboxyl-containing azonitriles and their salts as initiators.

26. No one previously arrived at my invention recited in Claim 25. Over five decades after Phillips et al. and Robertson, leading to my claimed invention, no one has ever adapted a PVA water-soluble container to safely and efficiently deliver a determined amount of a powder azo-initiator into a medium of aqueous polymerization to produce a water soluble or emulsifiable polymer. Such a long period in a field that is as economically significant and frequently studied as the field of technology to which his claimed invention relates clearly supports a finding of nonobviousness.

27. The claimed invention is contrary to the prior art's teaching. In an effort to address problems associated with toxicity and loss of expensive material, over the decades preceding Applicant's invention, chemists utilized costly granulation equipment and cumbersome processes to form azo-initiator granules. Unfortunately, however, the granules still produce deleterious dust, especially as the integrity of the granules degrades with handling and over time. Furthermore, granulation may compromise the quality of the initiator. Thus, the prior art taught granule formation in an effort to overcome the problems attributed to raw azo-initiator powder.

28. Rather than attempt to improve upon the process of forming granules, I opted for an entirely different approach. My approach involved introducing a new material to an aqueous

polymerization batch, namely, the material comprising the water soluble bag. Developing such an approach required considerable analysis and testing to ensure that the water soluble bag would not adversely impact the contained azo-initiator powder or the polymerization process.

29. The results achieved by the claimed combination are greater than the sum of the separate results of its parts. The combination is synergistic. The result, namely, safe and efficient delivery of a toxic and expensive azo-initiator in its purest form, greatly exceed what a water soluble polymer and a dry powder azo-initiator could provide separately.

30. Temsa produces and sells, under the trade name AZCAT, a polymerization initiator package composed of a water soluble polymeric bag with a sealable opening, a measured amount of a dry powder water soluble azo-initiator contained inside the bag, and a sealing tie comprised of the same water soluble polymeric material as the polymeric bag. The commercially successful product is the claimed invention. Since 2005, Temsa has sold 50 to 100 tons of the claimed initiator package annually. Annual sales revenue greatly exceeds \$1 million. Millions of pounds polymers have been processed using Temsa's AZCAT initiator package.

31. The commercial success is due to the unique functionality and characteristics of the initiator package itself, rather than to other factors such as marketing.

32. The purchasing conditions are driven primarily by functionality of the claimed initiator package, rather than marketing or other factors. The decision to purchase Temsa's initiator package requires careful consideration by knowledgeable, highly trained and extraordinarily careful industrial chemists. It takes, at the very least, several weeks for a customer to receive

samples of the initiator package, test the initiator package in polymerization batches, evaluate the processing and test the resulting product.

33. Customers have favorably expressed to me a strong preference for the dry powder water soluble azo-initiator contained in the safe-to-handle water soluble bag. Customers have also expressed to me a strong preference for the determined amount of azo-initiator. Additionally, Customers have explained that commercially available azo-initiator granules are disfavored due to their cost, tendency to produce deleterious dust, especially as granule integrity degrades with handling and the passage of time, and difficulty to properly meter the correct amount of granules into a polymerization batch.

I, the undersigned declarant, further state that the above statements are made with the knowledge that willful false statements and the like are punishable by fine and/or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that any such willful false statements may jeopardize the validity of this application or any patent resulting therefrom.

/Asim Sarkar/
Asim K. Sarkar

October 18, 2009
Date